ABSTRACT

Featured are new methods for performing intra-ocular surgery that allow surgical personnel to access the intra-ocular volume to perform a surgical procedure or technique but which does not require the use of sutures to seal the sclera and/or conjunctiva following the procedure. The methods of the present invention generally include providing an entry alignment device and inserting the entry alignment device into an eye through both the conjunctiva and sclera so as to form an entry aperture that extends between the exterior of the eye and the intra-ocular volume within the eye. The provided alignment device is configured so as to form or provide an aperture or opening in each of the conjunctiva and sclera of the eye and to maintain these apertures or openings in each of the conjunctiva and sclera aligned during the surgical procedure so these apertures or openings form the entry aperture. In more particular aspects, the provided entry alignment device is sized such that when the entry alignment device is removed from the eye following the completion of the surgical procedure, the aperture or opening formed in the sclera seals without the use of sutures. In a more specific aspect of the present invention, the provided entry alignment device is sized such that the apertures or openings and thus the entry aperture are self sealing. In other embodiments, a plurality of entry alignment devices are provided so a plurality of entry apertures can be formed in the eye. The invention also features a high speed vitreous cutting and aspirating device particularly configured for use in such methods and surgical procedures and techniques as well as the related entry alignment devices and other surgical instruments.